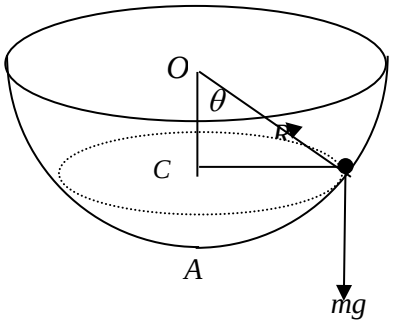
Question Number	Scheme	Marks
2.		
	$R\sin\theta = m\times 6r\sin\theta\times\frac{g}{4r}$	M1A1A1
	$R=\frac{3}{2}mg$	
	$R\cos\theta = mg$	M1A1
	$\frac{3}{2}mg\cos\theta = mg$	DM1
	$\cos\theta=\frac{2}{3}$	A1
	$OC = 6r\cos\theta = 6r\times\frac{2}{3}=4r$	M1A1
		[9]

	Notes
M1	Attempt NL2 along *CP* with correct number of terms and forces resolved.
A1	Either side correct
A1	Fully correct equation
	Note:
	If R is not resolved then M0 **but** do allow if $\sin\theta$ is cancelled from **both** sides: $R = m\times 6r\times\frac{g}{4r}$ would score M1A1A1
	If r is used instead of the radius: $R\sin\theta = m\times r\times\frac{g}{4r}$ would score M1A1A0 (force resolved correctly on LHS but error in radius on RHS)
M1	Resolve vertically
A1	Correct equation
DM1	Eliminate *R* between the two equations. Depends on both M marks above
A1	Correct value for $\cos\theta$ seen or implied
M1	Attempt to obtain *OC* (allow sin/cos confusion)
A1	$OC = 4r$
	Note: If θ is the angle with the horizontal then all equations above will appear with $\sin\theta$ and $\cos\theta$ reversed.

Question Number	Scheme	Marks
ALT 1	**Case: using trig ratios where radius, L, and ω2 are never replaced** M1 A1 A1: R sinθ = m L ω2 M1 A1: R cosθ = mg DM1 A1: tan θ = $\frac{L\omega^2}{g} = \frac{L}{4r}$ M1 A1: tan θ = $\frac{L}{OC} \Rightarrow OC = 4r$	
ALT 2	**Case: resolving tangentially where R is never seen** $mg\sin\theta = m \times (6r\sin\theta) \times \frac{g}{4r}\cos\theta$ scores M1A1A1 M1A1 DM1 leads straight to $\cos\theta = \frac{2}{3}$ A1	